REMARKS

The amendment to claim 1 is supported by the original disclosure at page 7, lines 14-22. New claim 16 is supported by Figures 3b - 3f . Applicant submits that the amendment does not add any new matter to the disclosure.

The invention centers on an improved configuration of metal features for an FET-based MRAM device. The invention addresses the problems discussed at page 3, line 5-18 of the specification. Thus, the invention advantageously minimizes the occurrence of shorting between the M2 line and the strap connecting the FET caused by micro-trenching while enabling a reduction in the metal shield thickness for improved performance.

Figure 3f provides a cross section of the claimed structure. Specifically, the device of the invention is characterized in part by the presence of a metal shield (324) and conductive strap (326) which are self-aligned with respect to each other and are substantially coextensive. See the specification at page 7, lines 4-6 and page 9, lines 21-25. These portions of the specification and figures 3c and 3d describe the patterning that occurs to convert layers 320 and 310 into the metal shield 324 and conductive strap 326 respectively where the patterned layer 320 (now shield 324) acts as a mask for the underlying layers including layer 310 (which becomes conductive strap 326). The term "substantially" is intended to cover any minor deviations in the pattern transfer process fidelity which can be implied from the discussion of pattern transfer on page 9, lines 21-25 of the specification.

Childress et al. (US Pat. 6631055) disclose a flux guided magnetic tunnel junction head for use in a magnetic hard drive. Childress et al. does not disclose or suggest a lower metallization line embedded in a dielectric layer as required

by the present claims. Childress further does not disclose or suggest a structure where the magnetic tunnel junction stack is not coextensive with the metal strap.

Tsang (US Pat. 6909630) discloses a conventional MRAM-FET configuration where the capping layer (3104) is not self-aligned with and having substantially the same shape as the conductive layer (79). Note Figure 7 of Tsang. Tsang appears to be silent on the concept of self-alignment, much less the idea that capping layer 3104 be self-aligned with conductive layer 79. Tsang at col. 9, lines 20-50 and Figure 7 do not disclose of suggest the patterning of capping layer 3104 and conductive layer 79 to result in regions 3104 and 79 being substantially coextensive. Thus, applicant submits that Tsang does not disclose or suggest a conductive line structure for FET-based magnetic random access memory (MRAM) device where the metal capping layer is substantially coextensive with the conductive strap for connection with the FET. Tsang also does not disclose or suggest a method for forming such a structure.

Regarding the combination of Childress et al. and Tsang, applicant submits that such a combination would result in the adoption of Tsang's method for integrating the MTJ stack of Childress et al. into an FET-based MRAM device. Applicant notes that Childress does not speak to the formation of FET-based MRAM devices, but rather MTJ-based hard drive heads. Assuming this combination of references to be tenable, the combination would rely on Tsang's teaching of how to connect the MTJ stack of Childress et al. to a bitline and a wordline in as much as Childress et al. provides no teaching on how to create such connections. In such instance, the metal strap - shield configuration of Tsang would be adopted resulting in the non-coextensivity of Tsang and the punch-through problem which the present invention avoids.

For the above reasons, applicants submit that all the pending claims are now patentable over the prior art of record and that the application is in condition for allowance. Such allowance is earnestly and respectfully solicited.

Respectfully submitted,
Michael C. Gaidis

By /Steven Capella/
Steven Capella, Attorney
Reg. No. 33,086
Telephone: 845-894-3669